

## WE CLAIM:

1. A charge pump circuit to supply current to a controlled oscillating circuit, the charge pump circuit comprising:  
a first switch comprising a first state, said first switch coupled to a gate of an output diode; and  
a second switch comprising a second state opposite from said first state, the second switch coupled to a source of the output diode,  
wherein the second switch provides a charge up current to the output diode when the second state comprises an ON state.
2. The charge pump circuit of claim 1, wherein the first switch comprises a diode having a first semiconductor material.
3. The charge pump circuit of claim 1, wherein the second switch comprises a diode having a second semiconductor material.
4. The charge pump circuit of claim 1, wherein the first switch is coupled to a capacitance.
5. The charge pump circuit of claim 4, wherein the capacitance holds a bias voltage when said second switch comprises the ON state.
6. The charge pump circuit of claim 1, wherein the first switch

disconnects the gate of the output diode when said first state comprises an OFF state.

7. The charge pump circuit of claim 1, wherein the first switch comprises an n-channel metal oxide semiconductor.

8. The charge pump circuit of claim 1, wherein the second switch comprises a p-channel metal oxide semiconductor.

9. A circuit, comprising:

a controlled oscillator controlled by an output signal having an offset current;

a charge pump circuit to add a charge up current to the offset current in response to a signal from a phase/frequency detector, wherein the charge pump circuit comprises a first switch having a first state and a second switch having a second state to add the charge up current to the offset current, in which the first state is opposite the second state; and

an output diode coupled to the first and second switches to provide the charge up current to the offset current.

10. The circuit of claim 9, further comprising a low pass filter coupled between the controlled oscillator and the charge pump circuit.

11. The circuit of claim 9, further comprising a multi-modulus

divider coupled to the phase/frequency detector.

12. The circuit of claim 11, wherein the multi-modulus divider outputs a feedback signal.

13. The circuit of claim 11, wherein the charge pump circuit includes a time constant applied by the first switch.

14. The circuit of claim 3, wherein a period for the time constant for the first switch is greater than a period for the ON state for the second switch.

15. The circuit of claim 9, wherein the output diode comprises a p-channel metal oxide semiconductor.

16. The circuit of claim 9, wherein a gate of the output diode is coupled to the first switch.

17. The circuit of claim 9, wherein a source of the output diode is coupled to the second switch.

18. A charge pump circuit coupled to an oscillating circuit, the charge pump circuit comprising:

a current source;

a source switch coupled to the current source to supply a charge up current;

an output diode having a source coupled to the source switch, wherein the output diode receives the charge up current; and

a gate switch coupled to a gate of the output diode to form a circuit to hold a bias voltage from the gate.

19. The charge pump of claim 18, wherein the source switch comprises a p-channel metal oxide semiconductor.

20. The charge pump circuit of claim 18, wherein the gate switch comprises an n-channel metal oxide semiconductor.

21. The charge pump circuit of claim 18, wherein the source switch comprises a state.

22. The charge pump circuit of claim 21, wherein the gate switch comprises another state opposite of the state of the source switch.

23. A method for adding a charge up current, the method comprising:  
setting a first switch coupled to a gate of an output diode to a first state;  
and

setting a second switch coupled to a source of the output diode to a second state, wherein the second state is opposite the first state,

wherein the second switch provides a charge up current to the output diode.

24. The method of claim 23, further comprising

outputting an output current from the output diode, wherein the output current comprises an offset current having the charge up current.

25. The method of claim 23, further comprising

generating the charge up current in response to a signal received at a charge pump circuit.

26. A circuit for adding a charge up current, the circuit comprising:

first setting means for setting a first switch coupled to a gate of an output diode to a first state; and

second setting means for setting a second switch coupled to a source of the output diode to a second state, wherein the second state is opposite the first state,

wherein the second switch provides a charge up current to the output diode.